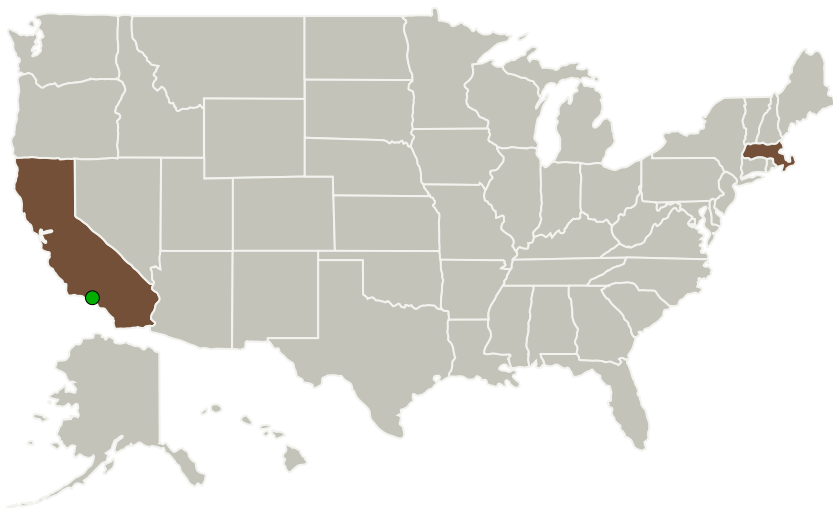





## Project Introduction

Nanostructured Thin Films (NSTF), used as substrates for catalysts, have proven to be highly active for oxygen reduction in fuel cells. This improvement in activity is expected to transfer to electrolyzer technology as the NSTF substrate layer, with a ruthenium oxide based catalyst, is used for oxygen evolution. Slow anode kinetics in electrolysis provide the bulk of the cell overpotential. An increase in anode catalyst activity and decrease in mass-transfer effects, as seen with the thin NSTF catalyst layers and ruthenium oxide based catalysts, would mean an increase in overall efficiency for the electrolyzer systems. In fuel cells, the catalyst layer thickness has been reduced by a factor of 20 compared to the state of the art, and specific activity has increased by an order of magnitude. An additional benefit is that the substrate manufacture, catalyst coating and MEA production are done via a roll-good process, ensuring consistency of product for high reliability.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Giner, Inc.	Lead Organization	Industry	Newton, Massachusetts
 Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



Long-Life MEAs and Catalysts for PEM Electrolyzers/Fuel Cells, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	3
Technology Areas	3
Target Destinations	3

# Long-Life MEAs and Catalysts for PEM Electrolyzers/Fuel Cells, Phase I

Completed Technology Project (2012 - 2012)



## Primary U.S. Work Locations

California

Massachusetts

## Project Transitions



**February 2012:** Project Start



**August 2012:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138260>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Giner, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Jason Willey

### Co-Investigator:

Jason Willey

# Long-Life MEAs and Catalysts for PEM Electrolyzers/Fuel Cells, Phase I

Completed Technology Project (2012 - 2012)



## Technology Maturity (TRL)

Start: **3**  
Current: **4**  
Estimated End: **4**



## Technology Areas

### Primary:

- TX03 Aerospace Power and Energy Storage
  - └ TX03.2 Energy Storage
    - └ TX03.2.2 Electrochemical: Fuel Cells

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System